DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 03/19/2009 was filed after the mailing date of 03/19/2009. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Response to restriction/election

2. Applicant's representative elected without traverse Group I, claims 1-4, 25-32 and 50-51 on 05/13/2009 and see interview summary.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.
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> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
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> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and

the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

4. Claims 1-4, 25-32, 50-51 and 59 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 1 defines a “system”. However, while the preamble defines a “system”, which would typically be indicative of an “apparatus”, the body of the claim lacks definite structure indicative of a physical apparatus. Furthermore, the specification indicates that the invention may be embodied as pure software. On the specification paragraph [0119] that is, the components constituting the image similarity calculation system are implementable on a computer and can be implemented as programs. Program is software. Therefore, the claim as a whole appears to be nothing more than a “system” of software elements, thus defining functional descriptive material per se.

Functional descriptive material may be statutory if it resides on a “computer-readable medium or computer-readable memory”. The claim(s) indicated above lack structure, and do not define a computer readable medium and are thus non-statutory for that reason (i.e., “When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized” – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the recited program. The examiner suggests:

1. Amending the claim(s) to embody the program on "computer-readable medium" or equivalent; assuming the specification does NOT define the computer readable medium as a "signal", "carrier wave", or "transmission medium" which are deemed non-statutory; or

2. Adding structure to the body of the claim that would clearly define a statutory apparatus.

Any amendment to the claim should be commensurate with its corresponding disclosure.

5. Claim 51 is rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. The Federal Circuit[1], relying upon Supreme Court precedent[2], has indicated that a statutory "process" under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a different state or thing. This is referred to as the "machine or transformation test", whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at 590"). While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform an article nor are positively tied to a particular machine that accomplishes the claimed method steps, and therefore do not qualify as a statutory

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[1] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

[2] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

process. *Machine test Analysis , in claim 51 in the steps " using ", "comparing" and "calculating" do not have any "computer " or " processor" or " device" to carry out all the steps of in claim 51. It is clear that claim 51 is not tied to a particular machine and claim does not fail to pass the machine test analysis. And also claim 51 does not have (a) physical or chemical transformation of a physical object, (b) no modification to data or signal; (c) claim 51 does not have either displaying or printing any where in claim ; (d) Modification and /or transformation not meaningful or insignificant. Therefore claim 51 requires computers or processors or device after the word "comprising".*

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.
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> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
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> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

6. Claim 59 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 59 defines a computer program embodying functional descriptive material (i.e., a computer program or

computer executable code). However, the claim 59 does not define a "computer-readable medium or computer-readable memory" and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the recited program. The examiner suggests amending the claim(s) to embody the program on "computer-readable medium" or equivalent; assuming the specification does NOT define the computer readable medium as a "signal", "carrier wave", or "transmission medium" which are deemed non-statutory (refer to "note" below). Any amendment to the claim should be commensurate with its corresponding disclosure.

Note:

"A transitory, propagating signal … is not a "process, machine, manufacture, or composition of matter." Those four categories define the explicit scope and reach of subject matter patentable under 35 U.S.C. § 101; thus, such a signal cannot be patentable subject matter." (In re Nuijten, 84 USPQ2d 1495 (Fed. Cir. 2007). Should the full scope of the claim as properly read in light of the disclosure encompass non-statutory subject matter such as a "signal", the claim as a whole would be non-statutory. Should the applicant's specification define or exemplify the computer readable medium or memory (or whatever language applicant chooses to recite a computer readable

medium equivalent) as statutory tangible products such as a hard drive, ROM, RAM, etc, **as well as** a non-statutory entity such as a "signal", "carrier wave", or "transmission medium", the examiner suggests amending the claim to *include* the disclosed tangible computer readable storage media, while at the same time *excluding* the intangible transitory media such as signals, carrier waves, etc.

Merely reciting functional descriptive material as residing on a tangible medium is not sufficient. If the scope of the claimed medium covers media other than "computer readable" media (e.g., "a tangible media", a "machine-readable media", etc.), the claim remains non-statutory. The full scope of the claimed media (regardless of what words applicant chooses) should not fall outside that of a computer readable medium.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-4 and 25-32, 50-51 and 59 are rejected under 35 U.S.C. 102(b) as being anticipated by Peng et al., ("Probabilistic Feature Relevance Learning for content-Based Image Retrieval" , computer vision and image understanding, vol.75, nos.1/2 July/August 1999, pp. 150-154 from IDS).

Regarding claim 1, *Peng discloses* image similarity calculation system *(see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN*

search based on current weightings to compute the similarity between the query and all images in the database) comprising:

an image similarity calculation unit *(see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search based on current weightings to compute the similarity between the query and all images in the database)* configured to:

use a probability model of a probability for an editing process to be applied to an image (see page 152-153, column 2, local Relevance Measure, probabilities measure);

compare a feature quantity for each divided small region of an inquiry image with a feature quantity for each divided small region of an reference image *(see pages 155-157, compared within subregion, thus making the relevance measure more local);* and

calculate an image similarity between the inquiry image and the reference image *(see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search based on current weightings to compute the similarity between the query and all images in the database).*

Regarding claim 2, *Peng discloses* the image similarity calculation system according to claim 1, wherein the probability model is determined for each region *(see page 152-153, column 2, local Relevance Measure, probabilities measure);* and

the image similarity calculation unit is configured to use the probability model when comparing the feature quantity for each divided small region of the inquiry image and the feature quantity for each divided small region of the reference image (*see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search*

based on current weightings to compute the similarity between the query and all images in the database).

Regarding claim 3, *Peng discloses* the image similarity calculation system according to claim 1, wherein the image similarity calculation unit is configured to use the probability model when calculating the image similarity between the inquiry image and the reference image (*see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search based on current weightings to compute the similarity between the query and all images in the database).*

Regarding claim 4, Peng *discloses* the image similarity calculation system according to claim 1, wherein the probability model is determined for each region *(see page 152-153, column 2, local Relevance Measure, probabilities measure)*; and

the image similarity calculation unit is configured to use the probability model when comparing the feature quantity for each divided small region of the inquiry image and the feature quantity for each divided small region of the reference image (*see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search based on current weightings to compute the similarity between the query and all images in the database)* and

when calculating the image similarity between the inquiry image and the reference image *(see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search based on current weightings to compute the similarity between the query and all images in the database).*

Regarding claim 25, *Peng discloses* the image similarity calculation system according to claim 1, wherein the local region is a divided region so as to correspond to a small region in the inquiry image or the reference image (*see pages 155-156, computed with subregion and partitioning).*

Regarding claim 26, Peng *discloses* the image similarity calculation system according to claim 1 wherein a small region in the inquiry image or the reference image is an equally sized rectangular region resulting from dividing an image (*see pages 155-156, computed with subregion and partitioning).*

Regarding claim 27, *Peng discloses* the image similarity calculation system according to claim 1, wherein a small region in the inquiry image or the reference image is one of regions which are divided so as to be partially overlap with each other (*see page 152, column 2, overlapping).*

Regarding claim 28, *Peng discloses* the image similarity calculation system according to claim 1, wherein a small region in the inquiry image or the reference image results from dividing only part of an image (*see pages 155-156, computed with subregion and partitioning).*

Regarding claim 29, *Peng discloses* the image similarity calculation system according to claim 1,wherein the feature quantity is based on at least one of color information, edge information, texture information, shape information, and motion information *(see pages 150-151, generally, a set of features (color, shape, texture, etc)).*

Regarding claim 31*, Peng discloses* the image similarity calculation system according to claim 1, wherein the editing process corresponds to at least one of

superposing a ticker on an image, superposing a caption on an image, superposing a character on an image, superposing an object on an image, partially cutting an image, partially cropping an image, partially mosaicking an image, and partially blurring an image (*see page 152, column 2, overlapping).*

Regarding claim 32, *Peng discloses* an image retrieval system to retrieve images using an image similarity calculated in the image similarity calculation system according to claim 1 *(see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search based on current weightings to compute the similarity between the query and all images in the database).*

Regarding claim 50, *Peng discloses* an image retrieval system to output an image similar to an inquiry image from a plurality of reference images based on a calculated image similarity using an image similarity calculation system according to claim 1 *(see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search based on current weightings to compute the similarity between the query and all images in the database).*

Regarding claim 51, *Peng discloses* an image similarity calculation method comprising the steps of using a probability model of a probability for an editing process to be applied to an image *(see page 152-153, column 2, local Relevance Measure, probabilities measure)*;

comparing a feature quantity for each divided small region of the inquiry image with a feature quantity for each divided small region of the reference image *(see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search*

based on current weightings to compute the similarity between the query and all images in the database); and

calculating an image similarity between an inquiry image and an reference image *(See page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search based on current weightings to compute the similarity between the query and all images in the database).*

Regarding claim 59, *Peng discloses* an image similarity calculation program for allowing a computer to perform a process of:

taking into account a probability model of a probability for an editing process to be applied to an image *(see page 152-153, column 2, local Relevance Measure, probabilities measure);*

comparing a feature quantity for each divided small region of the inquiry image with a feature quantity for each divided small region of the reference image (*see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search based on current weightings to compute the similarity between the query and all images in the database)*; and

calculating an image similarity between an inquiry image and a reference image *(see page 151, fig.2 and column 2, the system carries out image retrieval using a K-NN search based on current weightings to compute the similarity between the query and all images in the database).*

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peng as applied to claim 1, in above in view of Appas et al., "Speeding the Vector Algorithm for Regional Color Channel Features Based Indexing and Retrieval systems," vol.1611, 1999, pp.205-214 from IDS).

Peng discloses the image similarity calculation system.

Peng does not disclose regarding claim 30, wherein the feature quantity is at least one of an average value, a mode value, and a median value for color coordinates specified in color space systems such as RGB color space, HSV color space, YUV color space, YIQ color space, YCbCr color space, L*a*b* color space, and XYZ color space, and Dominant Color, Color Layout, Scalable Color, Color Structure, Edge Histogram, Homogeneous Texture, Texture Browsing, Contour Shape, and Shape 3D specified in international standard ISO/IEC15938-3.

However, Appas discloses regarding claim 30, wherein the feature quantity is at least one of an average value, a mode value, and a median value for color coordinates specified in color space systems such as RGB color space, HSV color space, YUV color space, YIQ color space, YCbCr color space, L*a*b* color space, and XYZ color space,

and Dominant Color, Color Layout, Scalable Color, Color Structure, Edge Histogram, Homogeneous Texture, Texture Browsing, Contour Shape, and Shape 3D specified in international standard ISO/IEC15938-3 (*see pages 206-209, color space and table 1, weight region).*

It would have been obvious to ordinary skill in the art at the time when the invention was made to use Appas's wherein the feature quantity is at least one of an average value, a mode value, and a median value for color coordinates specified in color space systems such as RGB color space, HSV color space, YUV color space, YIQ color space, YCbCr color space, L*a*b* color space, and XYZ color space, and Dominant Color, Color Layout, Scalable Color, Color Structure, Edge Histogram, Homogeneous Texture, Texture Browsing, Contour Shape, and Shape 3D specified in international standard ISO/IEC15938-3 in Peng's the image similarity calculation system because it will allow to provide for efficient indexing, excellent retrieval performance and very fast retrieval response, [Appas, page 205].

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to AKLILU k. WOLDEMARIAM whose telephone number is (571)270-3247. The examiner can normally be reached on Monday-Thursday 6:30 a.m-5:00 p.m EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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